[0023] wherein the remote server is configured to monitor operation of each pressure sewer installation based on messages received from each pump control system and to affect operation of each pump control system by transmission of one or more commands from the remote server to each pump control system.

[0024] The system may further comprise a computerised user interface in communication with the remote server to allow remote user control of each pump control system.

[0025] The system remote server may be configured to determine an alarm condition based on the messages received and to automatically transmit one or more alarm messages to one or more user recipients, the one or more alarm messages including an indication of the alarm condition.

[0026] Some embodiments relate to a pressure sewer installation, comprising the described pump control system and further comprising the pump, the sensor and the fluid reservoir.

[0027] Some embodiments relate to a kit for a pressure sewer installation, the kit comprising the described pump control system and further comprising the pump, the sensor and the fluid reservoir.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Embodiments are described in further detail below, by way of example, with reference to the accompanying drawings, in which:

[0029] FIG. **1** is a schematic representation of a pressure sewer installation having a pump control system according to some embodiments;

[0030] FIG. **2** is a schematic diagram of the pump control system;

[0031] FIG. **3** is an electrical circuit schematic diagram of the pump control system;

[0032] FIG. **4** is a schematic diagram of a pressure sewer network monitoring system according to some embodiments;

[0033] FIG. **5** is an example user interface display generated by interface components of the pressure sewer network monitoring system;

[0034] FIG. **6** is an example plot of fluid level in a fluid reservoir of one pressure sewer installation over time.

[0035] FIG. **7** is a further example user interface display generated by interface components of the pressure sewer network monitoring system;

[0036] FIG. **8** is a further example user interface display generated by interface components of the pressure sewer network monitoring system; and

[0037] FIGS. **9**A and **9**B are example reports of measured fluid levels in multiple installations in different zones.

DETAILED DESCRIPTION

[0038] Described embodiments generally relate to pressure sewer systems and the monitoring and control of such systems or components, such as pumps, in such systems. Some embodiments specifically relate to pump control systems for pressure sewer installations, while other embodiments relate to systems for monitoring a network of pressure sewer installations containing described pump control systems. Further embodiments relate to pressure sewer installations or kits therefor that include the pump control systems.

[0039] Referring in particular to FIGS. **1**, **2** and **3**, there is shown a pressure sewer installation **100** comprising a pump control system **110** operating in cooperation with a buried sewerage tank **120**. The pump control system **110** constitutes the above-ground part of installation **100** while the sewerage tank **120** constitutes the in-ground part. The sewerage tank **120** has a fluid reservoir **122** that is arranged to receive waste water from a domicile or other building **102** via an inlet conduit **126**. The fluid reservoir **122** houses a pump **124** therein, with the pump **124** being arranged to pump fluid out of the reservoir **122** via a fluid outlet conduit **128** into a reticulated sewerage network of fluid conduits.

[0040] The in-ground components of installation **100** also include a level sensor **112** and a float switch **212**. The level sensor **112** may be a pressure transducer, for example, and is in electrical communication with the pump control system **110** via suitable means, such as an electrical cable. The pump **124** operates under the control of pump control system **110**, only turning on and off in response to the action of a suitable pump contactor (relay) **224** that supplies mains power to the pump **124** from a mains power supply **248**.

[0041] The level sensor **112** may be arranged to have the sensing head generally submerged below the fluid level in order to obtain a constant accurate measure of the fluid level within the fluid reservoir **122** and provide a constant (or sufficiently regular as to be effectively constant) output signal to the pump control system **110**. Float switch **212** is provided as a high level fail safe, so that when the fluid level in the reservoir **122** gets above the shut-off level of the float switch **212**, the float switch **212** provides a fluid level high signal to pump control system **110**, which causes pump **124** to begin pumping fluid out of the reservoir **122** (if it was not already doing so).

[0042] Pump control system **110** is the above-ground part of installation **100** and may be located on a wall or other position for easy access by inhabitants of the domicile **102** or maintenance personnel. Pump control system **110** has a housing **202** that is closed and locked against persons other than authorised personnel. The housing **202** has a visual alarm indicator **203** and an audible alarm **204** to indicate to the inhabitants that a fault has occurred or is occurring. A mute button **205** may be located on an external part of the housing **202** and may be actuated in order to silence the audible alarm **204**.

[0043] Pump control system **110** has a controller **208**, a wireless transceiver unit **210**, a backup power supply, for example in the form of a battery **215**, a relay **224** to control operation of the pump **124** and an electrical supply and control block **240**. Pump control system **110** may also have one or more additional wireless or wired transceivers or receivers (not shown). One or more flow meters and/or other instruments (not shown) associated with water, power or other utilities may also form part of system **100** and be in communication with the one or more additional wireless or wired transceivers or receivers. Controller **208** comprises a memory (not shown) and at least one processor (not shown) configured to execute program instructions stored in the memory. Also stored in the memory are a number of set points and control parameters for operation of the pump and the wireless transceiver unit **210**.

[0044] Controller **208** is enabled for two-way communication via transceiver unit **210** with a remote server **130** over wireless telecommunications infrastructure, for example using a standard GSM mobile telephony protocol. Controller **208** may also be enabled for one- or two-way communication with external devices, such as flow meters or other instruments (not shown), via additional transceiver or receiver units